

WHAT IS CLAIMED IS:

1. An air battery comprising:

a battery container having a surface in which air pores are formed;

5           an electrode group provided in the battery container and including an air positive electrode, a negative electrode, and a separator provided between the air positive electrode and the negative electrode; and

10           a laminated sheet including a barrier film which is provided between the surface of the battery container and the air positive electrode of the electrode group, and of which oxygen permeation coefficient is  $1 \times 10^{-14}$  mol·m/m<sup>2</sup>·sec·Pa or less, and  
15           a gap holding member which is laminated on the barrier film and is opposite to the air positive electrode, and the gap holding member comprising at least one selected from the group consisting of a porous film, a nonwoven fabric, and a woven fabric,

20           wherein the air pores of the battery container are closed by the laminated sheet.

2. An air battery according to claim 1, wherein the internal pressure in the battery container during continuous discharge is lower than the atmospheric  
25           pressure by 0.1 to 80 kPa.

3. An air battery according to claim 1, wherein the ratio of the gap in the battery container except

for the portion of the laminated sheet is 5 to 40%.

4. An air battery according to claim 1, wherein the battery container is formed of a laminate film containing aluminum and satisfying the following

5 formula (1):

$$(Y \times T) < 10^2 \quad (1)$$

where Y is Young's modulus (MPa) of the laminate film, and T is the thickness (m) of the laminate film.

5. An air battery according to claim 1, wherein  
10 the barrier film is formed of a hydrophobic material containing at least one polymer selected from the group consisting of polyolefin, fluoroplastic, and polyphenylene sulfide, and the thickness of the barrier film is in a range of 1 to 100  $\mu\text{m}$ .

15 6. An air battery according to claim 1, wherein the thickness of the gap holding member is in a range of 10 to 500  $\mu\text{m}$ .

7. An air battery according to claim 1, wherein the porosity of the gap holding member is in a range of  
20 10 to 90%.

8. An air battery according to claim 1, wherein the air permeability of the gap holding member is 1000 sec/100  $\text{cm}^3$  or less.

9. An air battery according to claim 1, wherein  
25 the porous film, nonwoven fabric and woven fabric are formed of a hydrophobic material containing at least one polymer selected from the group consisting of

polyolefin, fluoroplastic, polyphenylene sulfide,  
polyethylene terephthalate, polybutylene terephthalate,  
and polyether ether ketone.

10. An air battery according to claim 1, wherein  
5 the laminated sheet further comprises a second gap  
holding member which is laminated on the barrier film  
and is opposite to the air pores.

11. An air battery according to claim 10, wherein  
the second gap holding member comprises at least one  
10 selected from the group consisting of a porous film,  
a nonwoven fabric, and a woven fabric.

12. An air battery according to claim 1, wherein  
the air positive electrode contains a carbonaceous  
material.

13. An air battery according to claim 1, wherein  
15 the negative electrode contains at least one negative  
electrode active material selected from the group  
consisting of a carbonaceous material capable of  
deintercalating an alkaline metal ion or alkaline earth  
20 metal ion, a metal compound capable of deintercalating  
an alkaline metal ion or alkaline earth metal ion,  
an alkaline metal, and an alkaline earth metal.

14. An air battery according to claim 1, further  
comprising an electrolyte held in the separator.

15. An air battery comprising:  
25 a battery container having air pores;  
an electrode group provided in the battery

container and including an air positive electrode,  
a negative electrode, and a separator provided between  
the air positive electrode and the negative electrode;  
and

5           a laminated sheet provided between the battery  
container and the electrode group, and the laminated  
sheet comprising a barrier film of which the oxygen  
permeation coefficient is  $1 \times 10^{-14}$  mol·m/m<sup>2</sup>·sec·Pa or  
less, and a gap holding member which is laminated on  
10   the barrier film and comprises at least one selected  
from the group consisting of a porous film, a nonwoven  
fabric, and a woven fabric,

          wherein the air positive electrode of the  
electrode group is opposite to the gap holding member  
15   of the laminated sheet.

16. An air battery according to claim 15, wherein  
the electrode group is contained in a bag formed of the  
laminated sheet.

17. An air battery according to claim 16, wherein  
20   the internal pressure in the bag during continuous  
discharge is lower than the atmospheric pressure by 0.1  
to 80 kPa.

18. An air battery according to claim 16, wherein  
the ratio of the gap in the bag is 5 to 40%.

25           19. An air battery according to claim 15, wherein  
the battery container is formed of a laminate film  
containing aluminum and satisfying the following

formula (1):

$$(Y \times T) < 10^2 \quad (1)$$

where Y is Young's modulus (MPa) of the laminate film,  
and T is the thickness (m) of the laminate film.

- 5        20. An air battery according to claim 15, wherein  
the laminated sheet further comprises a second gap  
holding member which is laminated on the barrier film  
and is opposite to the air pores.